# AVIATION PHYSIOLOGISTS BULLETIN

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United States Army Air Forces



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## THE ALTITUDE TRAINING PROGRAM DURING 1943

The operation and accomplishments of the Altitude Training Program during the past year provide an opportunity for appraising its present status and future needs.

The magnitude of the undertaking is revealed by the fact that more than 275,000 aircrew have received this training during the last twelve months. Although many receive three periods of instruction in an altitude chamber, and most have two periods, we may conservatively estimate that at least 150,000 individuals have benefitted from the Program.

It is more difficult to assess the quality and value of the instruction. The commanding officers of Operational Training Units and of combat squadrons, and the aircrews themselves, generally believe that the Program has fulfilled an important need, by acquainting fliers with the physiological hazards experienced at high altitudes, and has given effective training in the use of protective equipment. The satisfactory employment of all types of oxygen equipment is a more objective measure of the success of the Program. Also of significance are the reports from Combat Crew Replacement Center Number 11 of the Eighth Air Force. Ninety percent of the pilots questioned at the Center during August reported adequate previous instruction in the use of oxygen and oxygen systems, only 8 percent considered their instruction inadequate and 2 percent had no prior training. The comparable figures for navigators were 88 percent, 8 percent and 4 percent; for bombardiers 98 percent, 0 percent and 2 percent; for gunners 72 percent, 10 percent and 18 percent. That the causes of the relatively unsatisfactory training of the gunners are being overcome is indicated by the improvement reported by the Center during the following month of September when more than 90 percent considered that their instruction had been adequate, and less than 2 percent had no previous training.

The basic responsibility of the Program for instruction in the need for oxygen and in the use of oxygen equipment has been re-emphasized by the Instructions issued from the Headquarters of the Air Forces on July 11. Prior to that a considerable portion of the training time alloted to the Units in the Training Command and in the Operational Training Units had been spent in long "flights" in the chamber at 35,000 - 38,000 feet, for the purpose of identifying those individuals who were most susceptible to bends. Such flights did not provide suitable conditions for effective instruction in oxygen problems, and the time which remained was generally considered inadequate. There was also a growing realization that few missions are being flown at altitudes where bends develop. Nor was the time available for the tests adequate for reliable classification. The new Instructions accordingly place little emphasis on classification for bends susceptibility and direct that more attention be given to the important problem of anoxia and its prevention.

The revised Instructions also give more freedom to the Aviation Physiologists for the detailed operation of the Program. This has become desirable because

of somewhat different conditions at various stations. The scientific competence of the Aviation Physiologist and the specialized training they have received at the School of Aviation Medicine completely justify this greater opportunity for the exercise of judgement and initiative.

One hundred twenty-eight officers and 21 enlisted men were graduated from the course at the School of Aviation Medicine, and were certified as Aviation Physiologists during the year. This now brings the total number to 222. Of these, 120 hold the degree of Doctor of Philosophy or Doctor of Science; the other 88 are Doctors of Medicine. Excepting unusual cases, it has been our policy to transfer those in the latter category to duties which only medical officers can perform, because there continues to be a shortage of physicians for the needs of the nation. It is now becoming difficult to secure suitably trained physiologists. The available supply has already been drained, and few additional men are completing their graduate training, inasmuch as selective service deferments have seldom been given to those in the early stages of their graduate work.

Training is now being offered in 45 Units, with the aid of 41 twenty-man and 19 eight-man chambers. This is an increase for the year of 14 Units and 22 chambers.

Special operating conditions unique to air forces outside the continental limits of the United States, and the necessity for additional training and classification, have required the establishment of Units in the Sixth, Seventh, Eighth and Eleventh Air Forces and in the Antilles Air Command. The facilities of the Department of Physiology at the University of Algiers, which include a small altitude chamber, have been available to the Twelfth Air Force. The Royal Air Force has frequently given valuable assistance in the execution of the Altitude Training Program in the Eighth Air Force.

Certain administrative and supply problems have been corrected during the past year by activating the Units as an Air Corps function attached to the Base Headquarters and Air Base Squadrons for administration. Technical supervision of the Program in each Unit has however remained under the control of the station surgeons.

An interesting aspect of this activity, during the year, followed the issuance of a Headquarters Memorandum, requiring all officers on flying status attached to Air Forces Headquarters to spend a day at the 34th Altitude Training Unit, Bolling Field. Through lectures, demonstrations and "chamber flight", given during that time, there was wide dissemination of knowledge regarding the objectives of the Program among staff officers. Their influence will be of value in achieving the ends we are striving to accomplish. The excellent display of equipment, such as life rafts, clothing, flotation jackets, emergency rations, etc. aroused much interest. This has led to a greater emphasis in the Program on demonstrations of such emergency equipment, its physiological significance and its employment.

Although the time and energy of the Aviation Physiologists have been devoted mostly to the teaching and administrative duties of the Program, many studies have been made relating to problems of human physiology at high altitudes.

Of especial interest are those concerned with the incidence and mechanisms of bends and with the nature of the delayed, shock-like reactions which occasionally follow by some hours a high altitude "flight". The experience gained by the Aviation Physiologists in the conduct of this training activity has also given them special competence to handle various problems relating to personnel and equipment in combat theatres. There is a small but increasing demand for officers to fulfill such functions.

There has been a growing appreciation of the value of the Altitude Training Program in assessing the general fitness of personnel for flight duty. From the physical and mental reactions of an individual during a chamber "ascent" the flight surgeon can gain an insight into the ability of his officers and men to perform their duties effectively at high altitudes. This is now recognized as a useful adjunct to the information gained from the 64 examination. In recognition of this, all students in the Aviation Medical Examiner's Course at the School of Aviation Medicine are now given instruction in altitude chamber procedures. And at most of the stations at which there are Altitude Training Units their activities are becoming more intimately associated with the work of the flight surgeons.

The initial success of the Program was due to the enthusiasm and initiative with which the Aviation Physiologists met the unforseen difficulties of a pioneer venture. Its continued success during the past year of more stabilized operation has required no less enthusiasm and devotion in the discharge of routine duties, which have often become monotonous by repetition. Those in charge of the Program have endeavored to relieve this monotony by varying the duties and assignment of personnel whenever possible, by assigning some officers to foreign duty and by establishing closer contacts between the Units and research establishments and Headquarters. But the sustained vitality of this undertaking will ultimately depend upon the vigor and imagination with which the Aviation Physiologists develop new means for adapting the Program to the constantly changing needs of the Air Forces. To this opportunity for important service there are no limits.

DETLEV W. BRONK
Coordinator of Research
Air Surgeon's Office

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## TREATMENT OF AEROEMBOLISM BY THE APPLICATION OF LOCAL PRESSURE

This is a preliminary report of a sucessrul procedure for relief of the incapacitating pain of aeroembolism. Twenty-seven subjects were studied in this series, 23 men reporting complete relief from pain while the remaining four obtained

partial relief.

During the course of a routine flight to 38,000 feet in the low pressure chamber, the author noticed that severe bends in his left wrist disappeared completely and within a few seconds, after a sphygmomanometer was applied to his left arm, and the pressure raised to approximately 50 mm.Hg. This phenomenon was checked repeatedly to eliminate the factor of chance. Relief was obtained upon every trial, and it was decided to test the efficacy of this procedure on all cases of bends located in the forearms and wrists, lower legs and ankles. These areas were chosen for study because of the ease with which a tourniquet can be applied.

The experimental procedure employed was as follows: Volunteer passengers were taken to 38,000 feet in the low pressure chamber without any information as to the purpose of the flight. Simple exercises were employed in order to increase the incidence of bends in the wrists and ankles. At three minute intervals after reaching altitude the subjects flexed their wrists twenty times, at the same time rotating their ankles. When a subject reported that he was suffering from "bends" in the extremities, the sphygmomanometer was applied by the observer and records were maintained of the minimum amount of pressure required to obtain relief. Records were also kept of the degree of relief obtained and the effect of releasing pressure after relief had been obtained. The pressure was applied immediately above the elbow for cases of bends below the elbow, and just above the knee for bends below the knee. Observers were instructed to avoid asking leading questions which might prejudice the subject's report as to whether or not he obtained relief from the bends by application of pressure. The above procedure was tested on seven subjects and was found to be satisfactory. Of these seven test cases, five obtained complete relief from the "bends", while two subjects reported partial relief.

Of twenty subjects studied, eighteen reported complete relief after application of pressure, while two subjects reported partial relief. Of these two cases, one obtained 90% relief immediately but total relief fifteen minutes later. The remaining subject reported 50% relief with 70 mm.Hg pressure, but the pain increased when the pressure was raised to 140 mm.Hg. However, the pain was reported to be above the point of pressure application. Permanent relief was reported by seven subjects while thirteen stated that the pain returned after the pressure was released. The amount of pressure required to give relief was variable, some subjects being relieved by as little as 20 mm.Hg pressure, while others required as much as 190 mm.Hg pressure. Digital pressure applied to the arterial pressure points proved as effective in relieving pain as the tourniquet procedure on a few trials. The efficiency of this procedure is still being tested.

The author feels that it would be premature to attempt an interpretation of the results being reported. However, it seems that reduction of arterial pressure locally is a key factor in relieving the pain of the bends. The relief obtained obviously is not due to local tissue anoxia because of obstruction of the circulation by pressure. This is demonstrated by the fact that relief from pain is

reported within a few seconds after the pressure is applied. "Numbing" of an extremity by means of a tourniquet does not occur rapidly enough to account for the results. A few tests showed that pain reception on the hand was normal after five minutes of continuous pressure (140 mm.Hg.) It is possible that the formation of nitrogen bubbles in the smaller arteries results in a stoppage of the arterial bed; pain then could result from a stretching of the smaller arteries. By decreasing the arterial pressure, the stimulation of the nerve endings in the endothelial lining of the arteries would be diminished. Further studies are being conducted in an attempt to determine the mechanism involved, and also further cases are being studied to test the pressure technique more fully.

The present procedure for combating "decompression sickness" is denitrogenation. While there is no question that denitrogenation has a protective value, it is clear that it is time consuming and impractical under many circumstances. The pressure technique reported approaches one hundred percent efficiency, at least in the cases tested to date. It also might have the advantage of simplicity and could be used by flying personnel on altitude missions. With the onset of pain at altitude the victim can either apply a tourniquet to the arterial pressure point above the affected area, or he can merely apply digital pressure in order to obtain relief.

ALBERT I. LANSING
First Lieutenant, Air Corps
20th Altitude Training Unit
McChord Field, Washington

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## AVIATION PHYSIOLOGISTS

Three classes of Aviation Physiologists have been graduated from the School of Aviation Medicine since the last issue of the Bulletin. The graduates and their present assignments are as follows:

Class X, Beginning August 9, 1943

| Name and Rank | Degree | Station |
|---|---|---|
| Boettiger, Edward G., 1st Lt., A.C. | Ph.D. 1939, Harvard | Ephrata AAB, Wash. |
| Brooks, Phillips M., 1st Lt., A.C. | Ph.D. 1943, Stanford | Aero Medical Lab. Ohio |
| Cagle, Fred R., 1st Lt., A.C. | Ph.D. 1942, Michigan | Smoky Hill AAF, Kansas |
| Marcus, Emanuel., 1st Lt., M.C. | M.D. 1942, Rush | Tyndall Field Florida |
| McAlister, Dean F., 1st Lt., A.C. | Ph.D. 1936, Wisconsin | Salt Lake City AAB, Utah |
| McMichael, Morton., 1st Lt., M.C. | M.D. 1941, John Hopkins | Santa Ana AAB, California |

| Name and Rank | Degree | Station |
|---|---|---|
| Spiegel, Frederick S., 1st Lt., M.C. | M.D. 1942, Cincinnati | Las Vegas, AAF, Nevada |
| Goellner, Karl E., 2nd Lt., A.C. | Ph.D. 1943, Michigan | Selfridge Field, Michigan |
| Grobstein, Clifford, 2nd Lt., A.C. | Ph.D. 1940, California | Clovis AAB, New Mexico |
| Hamerstrom, Frederick N., 2nd Lt., A.C. | Ph.D. 1941, Wisconsin | Mountain Home AAB, Idaho |
| Hooper, Emmet T., Jr., 2nd Lt., A.C. | Ph.D. 1938, California | Gowen Fld., Idaho |
| Horn, Edward C., 2nd Lt., A.C. | Ph.D. 1941, Princeton | Davis-Monthan Field, Arizona |
| Preer, John R., Jr., 2nd Lt. C.W.S. | B.S. 1939, Florida | Pyote AAB, Texas |
| Shaklee, Alfred B., 2nd Lt., A.C. | Ph.D. 1942, Minnesota | Smoky Hill AAF, Kansas |

Class XI, Beginning September 13, 1943

| Name and Rank | Degree | Station |
|---|---|---|
| Conley, Carroll L., Capt., M.C. | M.D. 1940, Columbia | Maxwell Fld., Alabama |
| Banner, Albert H., 1st Lt., A.C. | Ph.D. 1943, Washington | Salt Lake City AAB, Utah |
| Bricker, John W., 1st Lt., M.C. | M.D. 1940, Michigan | San Antonio Aviation Cadet Center, Texas |
| Brodkorb, Pierce, 1st Lt., A.C. | Ph.D. 1936, Michigan | MacDill Field, Florida |
| Gomberg, Bernard, 1st Lt., M.C. | M.D. 1941, Illinois | Maxwell Field, Alabama |
| Kendall, James I., 1st Lt., A.C. | Sc.D. 1929, Harvard | Salt Lake City AAB, Utah |
| Ratnoff, Oscar D., 1st Lt., M.C. | M.D. 1939, Columbia | San Antonio Aviation Cadet Center, Texas |
| Shrader, Jack C., 1st Lt., M.C. | M.D. 1940, Indiana | Will Rogers Field, Oklahoma |
| Sugar, Oscar, 1st Lt., M.C. | M.D. 1942, Geo.Washington | Santa Ana AAB, California |
| Taylor, Craig L., 1st Lt., A.C. | Ph.D. 1941, Stanford | Aero Medical Laboratory Ohio |
| Cantrall, Irving J., 2nd Lt., A.C. | Ph.D. 1940, Michigan | Salt Lake City, AAB, Utah |
| Meglitsch, Paul A., 2nd Lt., A.C. | Ph.D. 1938, Illinois | Dale Mabry Field, Fla. |
| Roelofs, Eugene W., 2nd Lt., A.C. | Ph.D. 1941, Michigan State | Salt Lake City AAB Utah |
| Tahmisian, Theodore N., 2nd Lt., A.C. | Ph.D. 1942, Iowa | Greenville AAB, South Carolina |
| Tokaji, Elbert, 2nd Lt., A.C. | Ph.D. 1941, Chicago | Santa Ana AAB, Calif. |
| Zwilling, Edgar, 2nd Lt., A.C. | Ph.D. 1940, Columbia | Reno AAB, Nevada |
| Furgason, Waldo H., T/Sgt., M.D. | Ph.D. 1936, Stanford | S.A.M. Randolph Field, Texas |
| Allen, Thomas H., Pvt., M.D. | Ph.D. 1941, Iowa | S.A.M. Randolph Field, Texas |
| Johnson, Wendell L., Pvt., M.D. | Ph.D. 1943, Indiana | S.A.M. Randolph Field, Texas |

Class XII, Beginning October 25, 1943

| Name and Rank | Degree | Station |
|---|---|---|
| Holmes, Joseph H., 1st Lt., M.C. | M.D. 1934, Western Reserve | Buckingham AAF Florida |
| Marzulli, Francis N., 1st Lt., A.C. | Ph.D. 1941, Johns Hopkins | Yuma AAF, Yuma Arizona |
| Myers, Hugh I., 1st Lt., A.C. | Ph.D. 1935, Brown | Salt Lake City AAB, Utah |
| Schloemer, Clarence L., 1st Lt., A.C. | Ph.D. 1939, Wisconsin | San Antonio Aviation Cadet Center |
| Werle, Jacob M., 1st Lt., M.C. | M.D. 1937, Western Reserve | Santa Ana AAB, California |
| Clancey, Clarence W., 2nd Lt., A.C. | Ph.D. 1940, Stanford | Richmond AAB,Va |
| Cook, Donald L., 2nd Lt., A.C. | Ph.D. 1942, Wisconsin | Mitchel Field, New York |
| Kaliss, Nathan, 2nd Lt., A.C. | Ph.D. 1938, Columbia | Will Rogers Fld, Oklahoma |
| Lein, Allen, 2nd Lt., A.C. | Ph.D. 1940, California (L.A.) | S.A.M. Randolph Field, Texas |
| Bailey, Joseph R., Sgt., M.D. | Ph.D. 1940, Michigan | S.A.M. Randolph Field, Texas |
| Collias, Nicholas E., T/4, M.D. | Ph.D. 1942, Chicago | S.A.M. Randolph Field, Texas |
| Blair, William F., Cpl., M.D. | Ph.D. 1938, Michigan | S.A.M. Randolph Field, Texas |
| Wheeler, Robert S., T/5, M.D. | Ph.D. 1942, Chicago | S.A.M. Randolph Field, Texas |
| Leigh, Walter H., Pfc., M.D. | Ph.D. 1938, Illinois | S.A.M. Randolph Field, Texas |
| Archdeacon, James W., Pvt., M.D. | Ph.D. 1943, Rochester | S.A.M. Randolph Field, Texas |
| Jones, Lowell L., Pvt., M.D. | Ph.D. 1939, California | S.A.M. Randolph Field, Texas |

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## RELATION BETWEEN BENDS AND PHYSICAL FITNESS

One hundred ninety-seven Aviation Students from the Pre-Flight School, San Antonio Aviation Cadet Center, were given simulated flights in an altitude chamber at 38,000 feet for three hours. Oxygen was used above 10,000 feet. The rate of ascent was 2,000 feet per minute; the rate of descent was 27 mm.Hg. per minute. At the same period in their training the students were given the Pre-Flight School Physical Fitness Test as devised by the San Antonio Aviation Cadet Center. This test consists of sit-ups, burpees, chinning, broad jump, dash, and cross-country and is described in School of Aviation Medicine Research Report No. 148.

One hundred sixty-seven students remained at altitude for the entire three hours; thirty students had to be brought to ground level before the end of the flight because of bends. Comparison of the mean physical fitness scores of the group which did not get the bends (Group A) and the one which did get the bends (Group B) showed that Group A averaged 1.57 points better than Group B. (The

average score for Group A was 49.20; for Group B, 47.63) That the difference is not of statistical significance is indicated by a critical ratio of only 1.30.

The present investigation thus indicates that there is no relation between the state of physical fitness and the incidence of bends in the subjects tested. However, this may not be true for groups other than Aviation Students. For this reason, similar investigations should be conducted on other AAF personnel.

Acknowledgment is given to the staff of the 29th Altitude Training Unit, San Antonio Aviation Cadet Center for securing data on altitude chamber flights, and to the Physical Training Staff, San Antonio Aviation Cadet Center, for conducting the physical fitness tests.

PETER V. KARPOVICH, M.D.
School of Aviation Medicine
Randolph Field, Texas

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## THE INCIDENCE OF BENDS DURING DIFFERENT PERIODS OF THE DAY OBSERVED AT THIRTY SECOND ALTITUDE TRAINING UNIT LAS VEGAS ARMY AIR FIELD

The following analysis relates incidence of decompression sickness during Altitude Chamber flights at 38,000 feet for 3 hours to the diurnal cycle. All flights fell within 4 distinct time intervals; the morning flights between 0700 and 1200; the afternoon flights between 1300 and 1800; the evening flights between 1800 and 2300; the night flights between 2200 and 0400 of the following day.

| | | MORNING 0700-1200 | AFTERNOON 1300-1800 | EVENING 1800-2300 | NIGHT 2200-0400 |
|---|---|---|---|---|---|
| Total No. of Trainees reaching 38,000 feet. | | 2,693 | 2,593 | 1,341 | 210 |
| Total Bends Reported | No. | 809 | 498 | 278 | 25 |
| | % | 30 | 15.4 | 20.7 | 11.9 |
| Unbearable Bends | No. | 415 | 260 | 183 | 19 |
| | % | 15.4 | 10 | 13.6 | 9.1 |
| Chokes | No. | 45 | 22 | 14 | 2 |
| | % | 1.7 | 0.8 | 1.0 | 1.0 |

The incidence of bends during chamber flights appears to be significantly higher in the morning than at any other time of day or night. The slight increase in the evening over that during afternoon flights is probably not significant. Similar results have been obtained at the 33rd Altitude Training Unit, SAAAB. In

view of the difference indicated between morning flights and those at other times of the day, it is suggested that this factor may be important in determining the optimum time for high altitude bombing missions.

M. M. GUEST
1st Lt., AC

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## AN ANOXIC EXPERIENCE IN THE EIGHTH AIR FORCE

The personnel who experienced anoxia on this mission were as follows:

| NAME | RANK | AERONAUTICAL RATING | AGE | NO. COMBAT MISSIONS (INCLUDING THIS) | POSITION OCCUPIED |
|---|---|---|---|---|---|
| E.T.C. | S/Sgt. | G | 22 | 4 | Tail Gunner |
| D.B.Z. | S/Sgt. | G | 22 | 5 | Tunnel Gunner |
| W.E.E. | T/Sgt. | R | 29 | 2 | Radio Operator |
| G.W.B. | T/Sgt. | E | 26 | 5 | Engineer (Top Turret) |

For training, flying to this theatre, and all flights up to this, the crew had flown their regular ship which is equipped with demand type oxygen system. Their ship being "out" (for flying) on this occasion, the crew was manning plane No-, which is equipped with constant flow system. This flight was a day operational mission of 26 November 1943, and all personnel were occupying their regular positions on the B-24 D.

At about 1100 hours, with the plane between 21,000 and 25,000 feet, the tail gunner started having trouble with his oxygen flow. His A-8 mask froze and he tried to put on a spare mask. The connecting hose, however, was frozen and no supply was obtained. It was between 35 and 40 (C.) below zero, and it had been extremely cold for about an hour. The tail gunner passed out at 1130 (plane at 25,000 feet.) The tunnel gunner saw this and started back to help, using a bail out bottle for the trip. Upon reaching the tail gunner, the tunnel gunner was able to thaw the tail gunner's second mask by breaking the ice formation before passing out himself at 1135. One of the waist gunners re-connected the tunnel gunner to a spare mask, then returned to his own position at 1140.

The engineer told the radio operator to go to the tail to assist the tail and tunnel gunners, who were unconscious. The radio operator, not understanding the proper use of a walk around bottle with constant flow system, turned on only one valve and started back along the catwalk. He began to suffocate, tore his mask to shreds and went to the flight deck where he attacked the co-pilot who was then at the controls. The engineer noticed a white froth about the radio operator's mouth. At 1145 the engineer stopped the radio operator's attack on the co-pilot. The engineer then put his own mask on the radio operator, who passed out. The engineer picked up a spare mask and because of his own anoxic condition as a result of the

extraordinary exertion without oxygen tried to plug his hose into the interphone system. This was at 1148. The pilot noticed this and also saw that the engineer had developed a cyanosis of the face, and therefore decided that it would be necessary to turn back.

At this point the plane was at 25,000 feet and one or two minutes from the coast of the continent on the way to the target. Descent at 1,000 ft./min. began and in two minutes, the engineer, who had never lost consciousness regained his full faculties with no after-effects whatsoever, the cyanosis disappearing. At 1206 hours a levelling off at 7,000 feet was done for four minutes, the tail gunner, tunnel gunner, and radio operator having all revived. All cleared their ears and a search for enemy shipping was instituted while continuing on the return trip to the home station. At 1215 descent at 1,000 ft./min. was resumed to 2,000 feet which altitude was kept until landing at the home station with full bomb load at 1425, after crossing the English coast at 1342.

The plane was equipped with A-8 masks and constant flow system. All crew members had been thoroughly indoctrinated in the causes, effects and prevention of anoxia and in the use of oxygen equipment. However, practical experience of the crew had been confined to a demand type system. The radio operator was ignorant of the proper method of turning the walk around bottle on in this case.

The tail gunner remembered all that happened until he passed out. After reviving, he had no symptoms until just before landing when he noticed a headache, pains in elbows, and a slight nausea but no vomiting. His symptoms lasted until the next day.

The tunnel gunner remembered all that happened until he passed out. Upon revival, he had a headache, groggy feeling and pains in the joints. His symptoms cleared the next day.

The radio operator has no recollection of his actions after he first tried to use the walk around bottle, and until after he revived on the way down. Shortly after revival he was told by the pilot to connect his radio. He had difficulty remembering exactly how to do this, but in less than 5 minutes was fully oriented. His only after-effect was a slight headache the next morning which cleared up in a few hours.

The engineer had no symptoms except loss of judgment and mild cyanosis, both momentary.

The tail gunner and tunnel gunner were grounded on 26 November, and restored to flying duty 28 November. The radio operator was grounded on 27 November and restored 29 November. The engineer was not removed from full flying duty.

HENRY F. STEINBOCK
Captain, Medical Corps
Squadron Surgeon

## OXYGEN ON THE REGENSBURG MISSION

(Quoted from "I saw Regensburg Destroyed" by Lt. Col. Beirne Lay, Jr. Saturday Evening Post, Nov. 6, 1943)

"In the briefing room the intelligence officer ..... pulled a cloth screen away from a huge wall map ..... There were low whistles. I felt a sting of anticipation as I stared at the red string on the map that stretched from our base in England to a pin point deep in Southern Germany ..... You could have heard an oxygen mask drop .....

"Murphy restlessly gave the Piccadilly Lilly another once-over, inspecting ammunition belts, bomb-bay, tires and oxygen pressure at each crew station. Especially the oxygen. It's human fuel, as important as gasoline, up where we operate .....

"The North Sea glittered bright as we left the bulge of East Anglia behind us. I stole a last look back at cloud-covered England, where I could see a dozen spare B-17's, who had accompanied us to fill in for any abortives, gliding disappointedly home to base.

"I fastened my oxygen mask a little tighter and looked at the little ball in a glass tube on the instrument panel that indicates proper oxygen flow. It was moving up and down, like a visual heartbeat, as I breathed, registering normal."